

LIVERMORE LAB REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, April 28-May 3, 2013.



THESE ARE THE GOLDEN YEARS



At 94, Dick Post wants to work as long as he can.

He was born three days after the World War I armistice and at 94 he still is going strong.

Lawrence Livermore chief scientist Dick Post is working on the storage of energy with specially designed flywheels, one of his many passions.

Why he keeps working on cutting edge science: "I don't know any better. I enjoy this very much. If I have ideas that are worthwhile then that's what I like to do."

Post is part of the 1 percent of the workforce 75 and older that are still working. He commutes four days a week driving himself and works eight hours a day.

With 40 patents to his name and 15 of those filed after he turned 90, Post says he'll keep working "as long as I can still contribute. "

To hear more of the interview, listen to [KGO Radio](#).



LLNL's Dona Crawford and Gordon Bell with the model of the computer rooms in the lobby of the TSF.

Computing pioneer Gordon Bell, who helped create the high performance computing revolution, visited the Lab recently to discuss the evolution of supercomputing since the 1960s.

The emergence in the '60s of a new, lower-cost computer class based on microprocessors formed the basis of Moore's Law. Bell posited that advances in semiconductor, storage and network technologies brought about a new class of computers every decade to fulfill a new need.

"While he was known as an architect and an entrepreneur, for me personally his great charm and greatest contribution has been his ability to understand and then communicate in a very pithy, often funny and understandable manner very deep or complex trends in computing," said Michel McCoy, head of Lawrence Livermore's Advanced Simulation and Computing Program.

To read more, go to [Inside HPC](#).



Abhinav Bhatele is a past recipient of the George Michael Memorial HPC Fellowship.

For doctoral candidates in supercomputing, the George Michael Memorial HPC Fellowship offers a rapid plug-in to the global network of leading high performance computing organizations, from research institutions to industry.

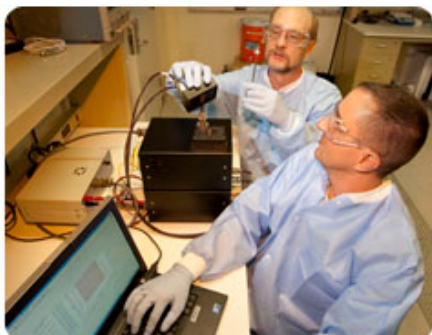
The late George Michael, a computational physicist at Lawrence Livermore, was a founder of the annual supercomputing conference (SC), which is now in its 25th year. Michael, who died in 2008, is remembered for his ability to bring together diverse talent from academia, industry and national labs to advance HPC.

Past recipients report that the fellowship ticket to the annual supercomputing conference (SC) can be a career affirming and life changing experience.

Abhinav Bhatele, a 2009 fellow from the University of Illinois Urbana-Champaign, found the fellowship an effective vehicle for spreading the word about his research. "The fellowship award has been instrumental in disseminating my research and dissertation work on 'topology aware task mapping' within the field of HPC," said Bhatele, who is now a researcher in the Computation Directorate at Lawrence Livermore.

To read more, go to [HPC Wire](#).

SCIENTISTLIVE IN LESS THAN THREE MINUTES



Mechanical engineer Reg Beer (right) and electronics engineer Gary Johnson test a new polymerase chain reaction (PCR) instrument developed at Lawrence Livermore.

There are a range of innovations designed to cut costs and increase the speed of new drug discovery.

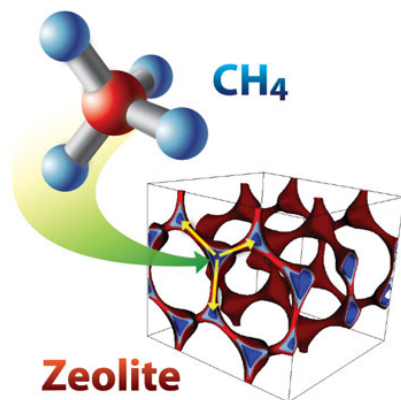
One such method is a sub-three-minute amplification of nucleic acids (DNA and RNA) via polymerase chain reaction (PCR) developed by Reginald Beer and his team of scientists and engineers at Lawrence Livermore.

Beer set out to find out just how fast PCR could go. The standard approach to PCR typically takes about an hour, which is a vast improvement over pre-PCR techniques that required days.

But Beer didn't want to wait that long so he and his colleagues created a device to demonstrate PCR times of less than three minutes.

Now that Beer and his team have demonstrated sub-three-minute PCR, they are working to develop a real-time-detection device. They envision a PCR instrument that can complete a test, from sample to results, in five to 10 minutes.

To read more, go to [Scientist Live](#).



LLNL researchers are using molecules called zeolites to capture methane.

Methane is a shy molecule, one that doesn't interact much with its surroundings. Creating a substance that can coax methane out of a gas stream while letting everything else go by is tricky, so Lawrence Livermore researchers are using computer simulations to test thousands of materials to come up with a few that could do the job.

"We are looking for ways in which stray methane can be concentrated and utilized," said Amitesh Maiti, a physicist at Lawrence Livermore. "This is a very interesting chemistry challenge."

Maiti and his colleagues examined how a liquid solvent and solid structure could capture methane from dilute to moderately concentrated sources. What they found is that a solid structure, called a zeolite, a porous mineral commonly used as adsorbers, did the trick.

To read more, go to [Scientific American](#).

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send [e-mail](#).

